L 18730-66

ACC NR: AP6005132

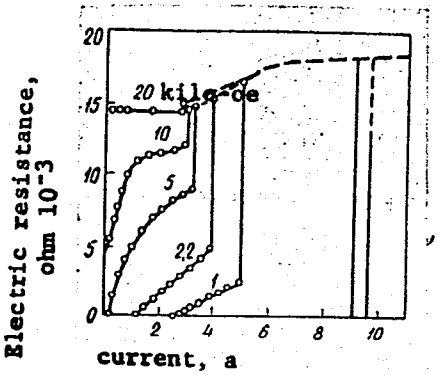


Fig. 1. Resistance as a function of the magnitude of the current introduced in a longitudinal magnetic field, for the alloy Zr + 4% Nb. Deformation 82%, tempering 550°C for 4 hr.

Card 2/3

L 18730-66
ACC NR: AP6005132

the disruption of superconductivity occurs over a wide range of the values of the current and magnetic field. Apparently, various sectors of the superconducting circuit differ in the dependence of their critical current on the intensity of the magnetic field. Electric resistance increases with increasing magnetic-field intensity. On the whole, the character of the transition curves indicates that, in the alloy investigated, disruption of superconductivity by current in a longitudinal magnetic field occurs gradually owing to the successive elimination of the superconducting state of individual sectors of the superconducting circuit. Although specimens in fields of the order of 20 kilo-oersteds become markedly heated, some of their sectors still remain in superconducting state. "The authors are indebted to A. Prekul for affording them the opportunity of performing the measurements with the aid of a superconducting solenoid." Orig. art. has: 3 figures.

SUB CODE: 11, 14, 20/ SUBM DATE: 28Jul65/ ORIG REF: 001/ OTH REF: 008

Card 3/3 SNV

ACC NR: AP6032620 (N) SOURCE CODE: UR/0126/66/022/003/0415/0419

AUTHOR: Yesin, V. O.; Levit, V. I.; Romanov, Ye. P.; Smirnov, L. V.

ORG: Institute of the Physics of Metals, AN SSSR (Institut fiziki metallov AN SSSR)

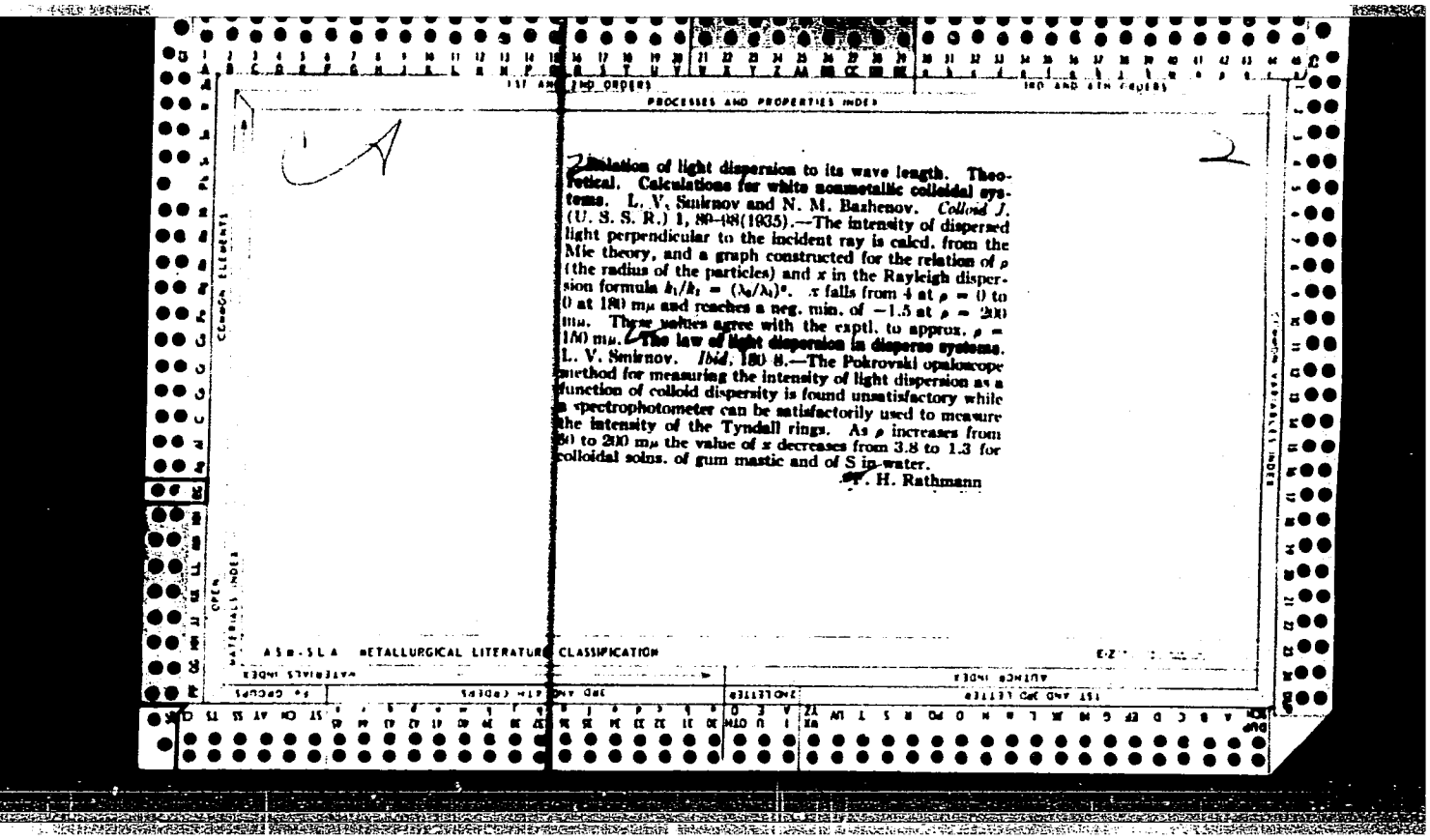
TITLE: Orientation, purity and perfection of molybdenum single crystals grown by electron-beam zone melting

SOURCE: Fizika metallov i metallovedeniye, v. 22, no. 3, 1966, 415-419

TOPIC TAGS: single crystal, molybdenum single crystal, single crystal growing, electron beam ~~zone~~ melting, single crystal orientation, single crystal purity, single crystal structure, MOLYBDENUM, METAL ZONE MELTING

ABSTRACT: Molybdenum single crystals, 3 mm in diameter and 60—120 mm long, were grown by the zone-melting method in a vacuum of 10^{-6}—10^{-7} mm Hg with an electron-beam heat source. The initial material, polycrystalline commercial-grade (99.8%-pure) molybdenum wire had a ratio of resistivities at 285 and 4.2K equal to 20. The orientations of the single crystals was found to depend on the rate of growing or on the rate of molten zone travel. No clear relationship was established between the single crystal perfection (the maximum disorientation angle between the elements of macromosaic substructure, maxθ') and the melting-zone speed at which the crystals were grown. A clear relationship, however, was found between the crystal perfection (max.θ') and its purity ($\rho_{285K}/\rho_{4.2K}$). The relationship can be empirically expressed

Card 1/2 UDC: 669.28:548.5

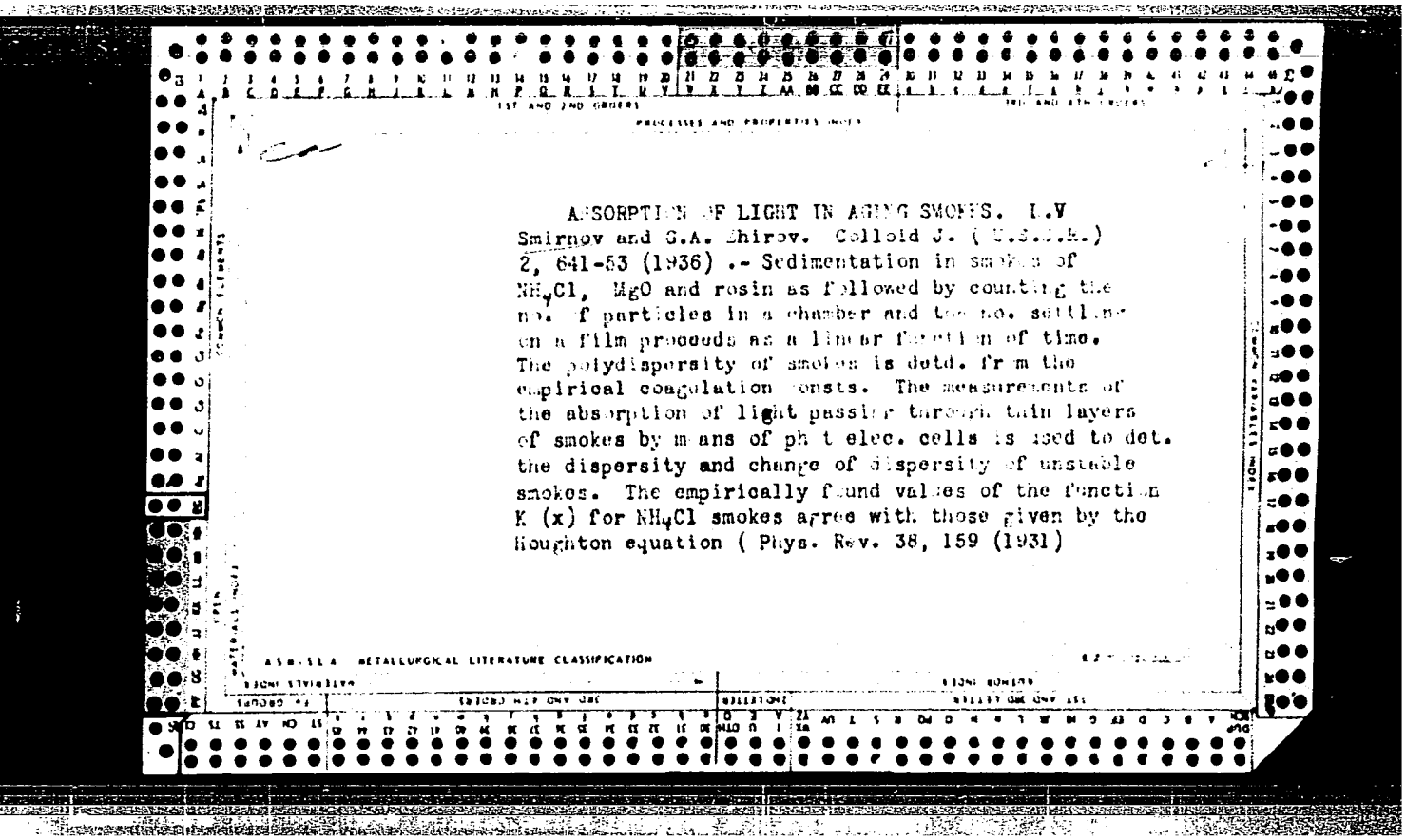


PROCESSES AND PROPERTIES INDEX

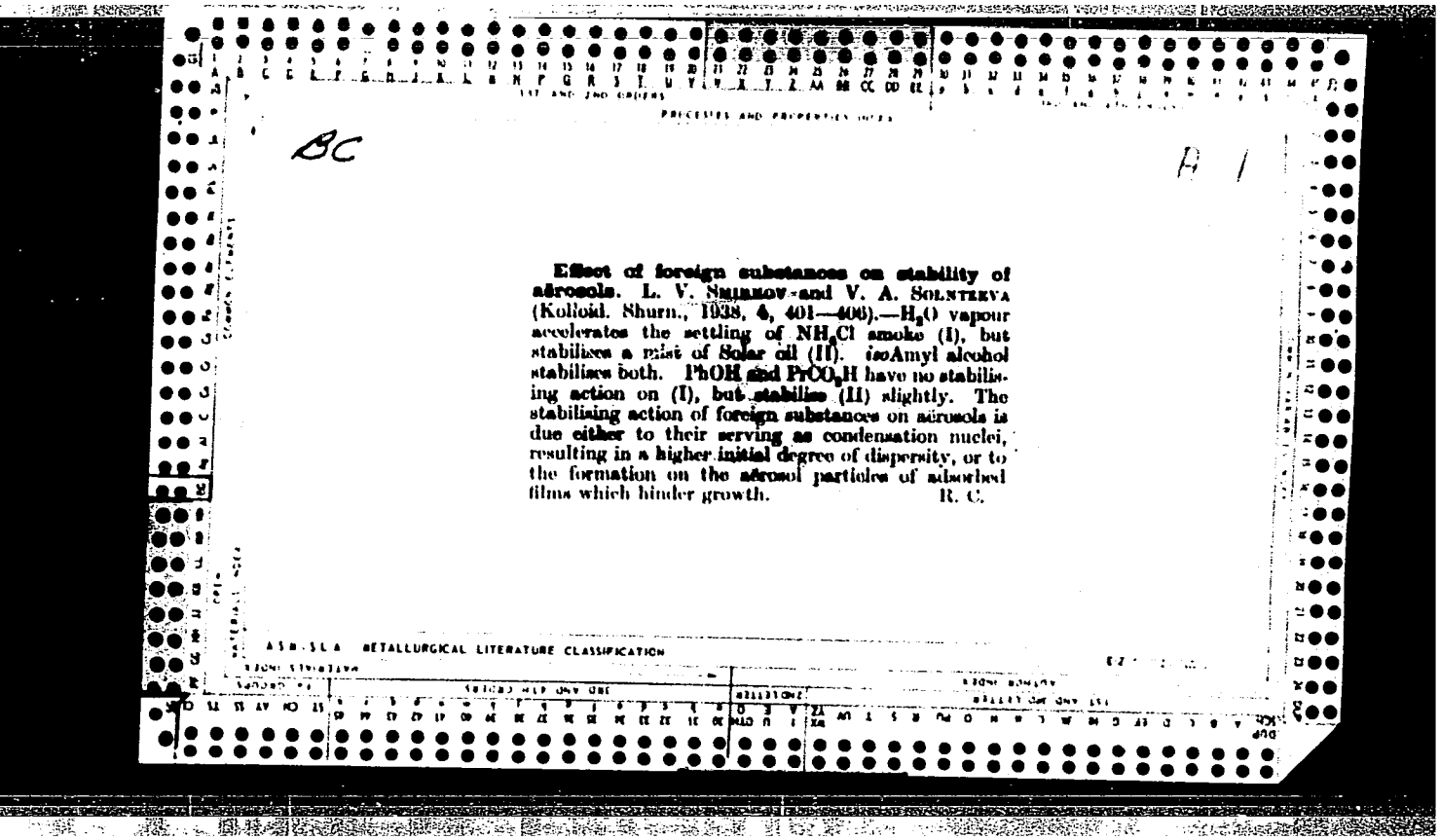
Relation of light dispersion to its wave length. Theoretical. Calculations for white nonmetallic colloidal systems. L. V. Smirnov and N. M. Bazhenov. *Colloid J.* (U. S. S. R.) 1, 89–98(1935).—The intensity of dispersed light perpendicular to the incident ray is calcd. from the Mie theory, and a graph constructed for the relation of ρ (the radius of the particles) and x in the Rayleigh dispersion formula $k_1/k_2 = (\lambda_2/\lambda_1)^x$. x falls from 4 at $\rho = 0$ to 0 at 180 mμ and reaches a neg. min. of −1.5 at $\rho = 200$ mμ. These values agree with the exptl. to approx. $\rho = 180$ mμ. The law of light dispersion in disperse systems. L. V. Smirnov. *Ibid.* 180 8.—The Pokrovski opaloscope method for measuring the intensity of light dispersion as a function of colloid dispersity is found unsatisfactory while a spectrophotometer can be satisfactorily used to measure the intensity of the Tyndall rings. As ρ increases from 50 to 200 mμ the value of x decreases from 3.8 to 1.3 for colloidal solns. of gum mastic and of S in water.

F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



ABSORPTION OF LIGHT IN AGING SMOKES. I.V Smirnov and G.A. Zhirov. Colloid J. (U.S.S.R.) 2, 641-53 (1936) .- Sedimentation in smokes of NH_4Cl, MgO and rosin as followed by counting the no. of particles in a chamber and the no. settling on a film proceeds as a linear function of time. The polydispersity of smokes is detd. from the empirical coagulation consts. The measurements of the absorption of light passing through thin layers of smokes by means of photoelec. cells is used to det. the dispersity and change of dispersity of unstable smokes. The empirically found values of the function K (x) for NH_4Cl smokes agree with those given by the Houghton equation (Phys. Rev. 38, 159 (1931)

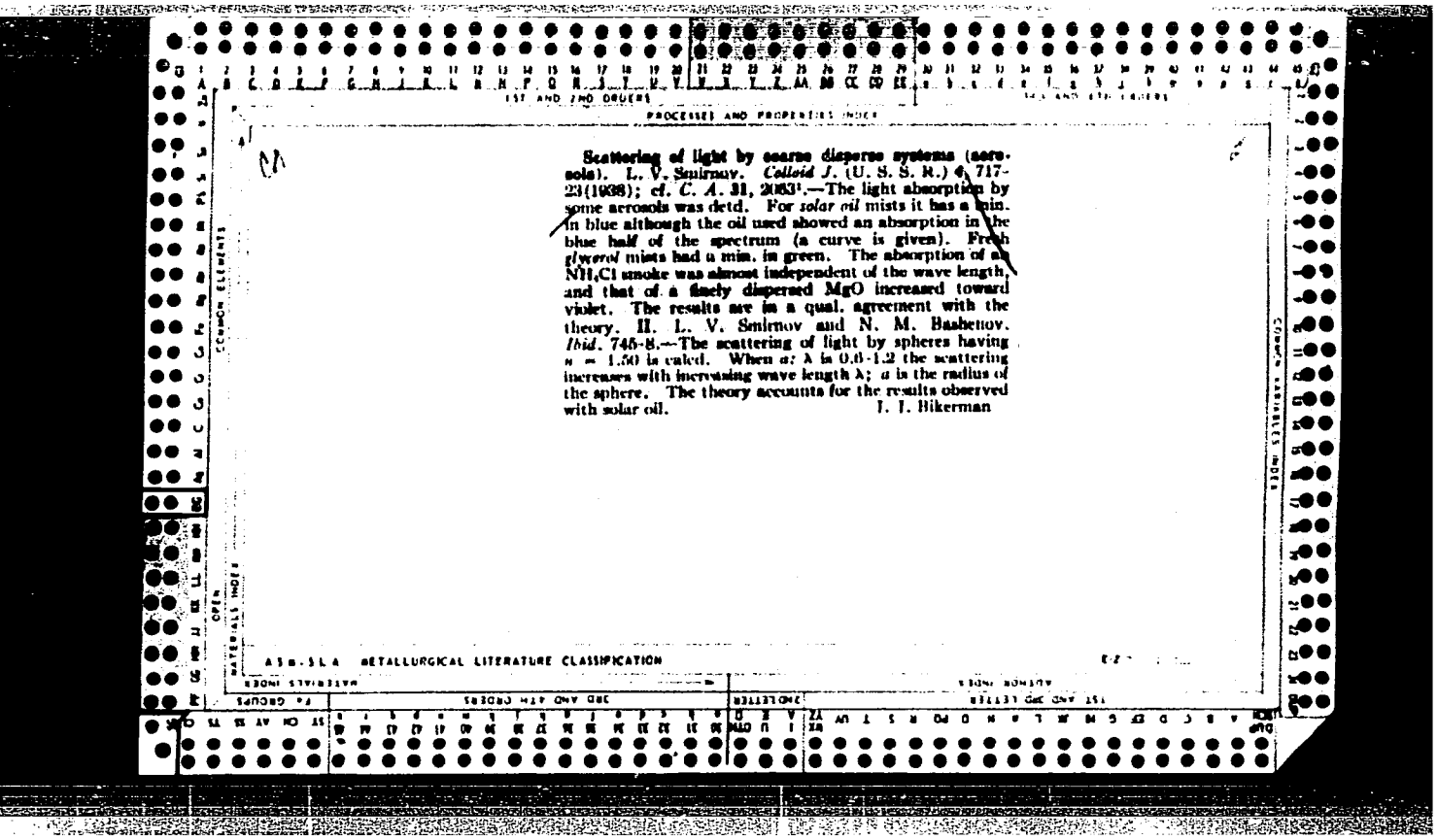


BC

H 1

Effect of foreign substances on stability of aërosols. L. V. Shubnov and V. A. Solntseva (Kolloid. Shurn., 1938, 4, 401—406).—H_2O vapour accelerates the settling of NH_4Cl smoke (I), but stabilises a mist of Solar oil (II). *iso*Amyl alcohol stabilises both. PhOH and $PrCO_2H$ have no stabilising action on (I), but stabilise (II) slightly. The stabilising action of foreign substances on aërosols is due either to their serving as condensation nuclei, resulting in a higher initial degree of dispersity, or to the formation on the aërosol particles of adsorbed films which hinder growth. R. C.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Scattering of light by coarse disperse systems (aerosols). L. V. Smirnov. *Colloid J.* (U. S. S. R.) 4, 717-23(1938); cf. *C. A.* **31**, 2063[1].—The light absorption by some aerosols was detd. For *solar oil* mists it has a min. in blue although the oil used showed an absorption in the blue half of the spectrum (a curve is given). Fresh *glycerol* mists had a min. in green. The absorption of an NH_4Cl smoke was almost independent of the wave length, and that of a finely dispersed MgO increased toward violet. The results are in a qual. agreement with the theory. II. L. V. Smirnov and N. M. Bashenov. *Ibid.* 745-8.—The scattering of light by spheres having $n = 1.50$ is calcd. When $a:\lambda$ is 0.6-1.2 the scattering increases with increasing wave length λ; a is the radius of the sphere. The theory accounts for the results observed with solar oil. I. I. Bikerman

1. SHIRNOV, L. V.; SHOSHINA, I. A.

2. USSR (600)

4. Molecules

7. Dichroism as a means for investigating anisotrophy of molecules. Trudy Len. Inst. pishch. prom. 1, 1949.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

SMIRNOV, L. V.

Chemical Abst.
Vol. 48 No. 3
Feb. 10, 1954
Mineralogical and Geological Chemistry

Dichroism of crystals of herapathite. L. V. Smirnov. *Trudy Leningrad. Tekhnol. Inst. Pishchevoi Prom.* 1948, 112–18(1949).—Herapathite is not a chem. compd. of a definite compn. but a series of compds. in which one mol. of quinone ($C_{20}H_{24}N_2O_2$) is combined with 1 H_2SO_4, 2 HI, and I_3, I_4, or I_8 as typical periodides (with 25–50% I). There are, however, other compds. of one mol. quinine with 3 or 6 mols. H_2SO_4, 2 or 4 mols. HI, and 4, 6, 10, or 14 atoms of I, and hydrates with 1, 2, or 4 mols. H_2O. The strongest polaroid properties are observed in suspensions in a viscous medium in which the elongated crystals are oriented by shearing. Detrimental effects of contaminations (H_2O, MeOH, EtOH, or AmOH, etc.) are studied by systematic crystn. expts. which show the very distinct changes of the crystal habitus by the accessories. With MeOH, as measured in red light (660 mμ): $\gamma = 1.782$; $\alpha = 1.580$; with EtOH: $\gamma = 1.734$; $\alpha = 1.597$ (in yellow light). The polarization power was measured with the König-Martens spectrophotometer. The absorption coeffs. perpendicular to the *b*-axis are 10–15-times greater than those parallel to *b*. For the wave lengths 470 and 550 mμ the absorption ellipsoids in the plane (*bc*) are given; they are strongly elongated in the *b*-direction. The absorption curves as functions of wave lengths are compared for herapathite, I-vapor, and solns. of I in MeOH and EtOH (cf. West, *C.A.* 32, 4405⁹). The dichroism originates from the uniform orientation of I-quinine complexes with strong dipole properties. The color is nearly always deep-red, only in EtOH-contg. samples a more bluish color was observed. The polarization is 100% for λ 440 to 550 mμ but decreased to 50% for λ = 600 mμ. The light transmission parallel to *b* is increased from about 25% to about 40% with increasing λ, and also perpendicular to *b* the transmission increases to about 10% in red light, while it is very low for shorter λ.

W. Hitel.

S. A.

Sect. A

535.543

3811. **Polarization, and interference maxima, in spectra of the visible and ultra-violet region.** L. V. SAMSONOV. *Zh. Tekh. Fiz.*, 21, 1486-91 (*No.* 12, 1951) *In Russian.*

Analyses bands occurring in the quartz spectrograph spectra of polarized light and due to the rotatory dispersion of the plane of polarization and to the fact that the front face of the dispersing prism acts as an analyser. The number of maxima and minima is determined not only by the change of rotatory dispersion with wavelength, but also by the total length of the optical path traversed by polarized light. The number and arrangement of these maxima is constant for each spectrograph, provided there is no optically active body in front of the slit; the picture is shifted towards longer or shorter wavelengths when such a body is inserted between the polarizer and the slit. A diagram of the calculated maxima for 3 different quartz thicknesses, and a graph showing the blackening curves obtained with both the ordinary and polarized light (plane parallel or at right angles to the slit) are presented. It is stressed that quartz should be replaced by another material combining a good

Optics

transmissivity in the ultraviolet with optical inactivity. Another method of eliminating the polarization maxima consists in using a compensating lens doubled made of right and left quartz. It can be said that, with the existing quartz spectrographs, photographic spectrophotometry using polarized light ceases to be accurate at c. $\lambda = 2\,500$ Å. Other disturbances occur in the absorption spectra of thin films due to the formation of interference bands when the specimen has an appropriate thickness. When this thickness is small, the width of interference bands in the ultraviolet becomes comparable with that of the polarization maxima and of the absorption bands, and, consequently, no accurate quantitative photometry is possible. The thickness of films can be ascertained from the interference lines in the absorption spectra. Any inequality of specimen thickness (down to $\frac{1}{10}$ of the thickness) can be evaluated by the method of line coincidence. Distortions due to a local change of the nd product (oblique or curved interference lines) can be used for the evaluation of dd, the accuracy of this method being dependent ultimately on the sharpness and width of the lines; that is why reflected light (filtered mercury) is often used. Despite the increase of width and decrease of sharpness of the lines, it is advantageous to combine measurements in ultraviolet, owing to the rapid rise of dispersion with decreasing wavelength. Examples of direct determination (without interferometer) of the interval $\lambda_2 - \lambda_1$ are given for plane and slim lamellae.

F. LACHMAN

Smirnov L.

USSR

Polarization absorption spectra of oriented dye molecule.
L. V. Smirnov. *Zhur. Eksptl. i Teoret. Fiz.* 23, 63-77 (1952); *Science Abstr.* 56A, 415(1953); cf. *C.A.* 49, 4408f.—The polarization absorption spectra of various dyes supported in an anisotropic medium were studied. The method consisted of measuring spectra of stretched films of polymers dyed by mixing an aq. soln. of dye with an aq. soln. of a polymer. The following dyes were investigated: azo, azino, di- and triphenylmethane, and polycyclic structures. Linear polymers, transparent in visible and ultraviolet regions, were used as medium. Wider variation in concn. and orientation is possible than in older methods of orientation such as adsorption on crystal faces. Theory of polarization of spectrum of orientation of long chains of conjugated bonds is given. Use of the sign of the dichroism to det. orientation of the dye mols. relative to the axis of stretching, and thus to the axis of the straight-chain polymer mols., is described. K. L. O.

SMIRNOV, L. V.

Dissertation: "Anisotropic Light Absorption by Dye Molecules." Cand Phys-Math Sci, Leningrad State U, Leningrad, 1953. (Referativnyy Zhurnal--Fizika, Moscow, Jun 54)

SO: SUM 318, 23 Dec 1954

SMIRNOV, L.V.

USSR

Anisotropic absorption of light and the orientation of electron oscillators in dye molecules. L. V. Smirnov. *Doklady Akad. Nauk S.S.S.R.* 82, 237–[illegible]. The absorption spectra were obtained for 35 dyes by using polarized light. The no. of bands in the range 1000–220 mμ, the position of the bands, and the magnitude and sign of the dichroism were detd. and related to the structure of the mol. The relative position of the oscillators can be detd. by the sign of the dichroism. J. Rovtar Leach

(Inst. High Molecular Compounds, Acad. Sci. USSR)

SMIRNOV, L. V.

Dichroism of a dye molecule and some benzene derivatives. L. V. Smirnov. *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 17, 695–8(1953).—All org. dye mols. contain chains of conjugated bonds; therefore, the properties of spectra in the region 200–800 mμ are detd. by the structure of the π-electron spectrum. The values of optical d. $D_{\parallel}$ and $D_{\perp}$ depend on the orientation of mol. and on the angles formed by the electronic oscillators with the structural axis. Dichroism indicates the degree of anisotropy of the π-electron system. Absorption spectra with polarized light or dichroism measurements of solns. of auramine, Congo red, methylene blue, crystal violet, parafuchsin, aurine, trimethoxyaurine, *p*-toluidine, *m*-nitrophenol, *p*-nitrophenol, *p*-aminophenol, and *p*-nitrosodimethylaniline are presented and discussed. Sym. triphenylmethane dyes have dichroism values different from the theoretically expected zero.

S. Pakswer

Inst. High Molecular Compounds, Acad. Sci. USSR

51-2-4/15

AUTHOR: Smirnov, L.V.

TITLE: Study of the molecular dichroism by the method of artificial orientation of molecules. (Issledovaniye molekulyarnogo dikhroizma metodom iskusstvennoy oriyentatsii molekul.)

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy) 1957, Vol.3, No.2, pp.123-133 (U.S.S.R.)

ABSTRACT: General expressions for the dichroism of an oriented layer (d) and of an isolated molecule (δ) and the relationship between these quantities are obtained. Only plane and linear molecules with conjugated bonds are considered. Two special cases of complete and incomplete orientation of the molecule with respect to the incident light are considered. In the final section the above mathematical results are applied to the following dyes: chrysophenine, brilliant yellow and Congo red. The absorption spectra of these dyes in the region 200-600 mμ are given in tables (Tables 1 and 2) and figures (Figs.3, 6, 7). The values of the layer and molecular dichroism were worked out and plotted. They are, for chrysophenine:-

λ (in mμ) =	d =	δ =
425	0.76	1
260	0.04	-0.28
235	0.15	-0.12

Card 1/2

80547
S/051/60/008/06/008/024
E201/E691

5.3100

AUTHORS: Smirnov, L.V. and Suprunenko, A.I.

TITLE: Dependence of the Electronic Spectra of the Simplest Derivatives of Benzene on pH. I. The Absorption Spectra of Oxybenzenes.

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 6, pp 799-805 (USSR)

ABSTRACT: The authors describe an investigation of the dependence of the electronic absorption spectra (between 180 and 350 mμ) of solutions of some oxyderivatives of benzene on pH of the solution. The results are used to identify the bands in these spectra. For convenience the following notation was employed by the authors: starting from 180 mμ the ^1B_b band, and the ^1L_a, ^1L_b bands of benzene were denoted by A, B, C respectively. The oxyderivatives of benzene were: phenol (Fig 1b and Fig 2), pyrocatechin (Fig 1a and Fig 3), resorcin (Fig 1c and Fig 4), hydroquinone (Fig 1) and Fig 5), and phloroglucine (Fig 1e and Fig 6). The A-band was found to lie at wavelengths smaller than 180 mμ. The B-band of phenol, dioxy- and sym. trioxybenzene lay in the region 210-228 mμ and is the analogue of the ^1L_a-band of benzene. The C-band of these compounds was more variable than the B-band; the former occurred in the region 265-290 mμ and originated

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E201/E691

Dependence of the Electronic Spectra of the Simplest Derivatives of Benzene on pH. I. The Absorption Spectra of Oxybenzenes

from the ^1L_b-band of benzene. The latter band is very weak in benzene but becomes much stronger in oxybenzenes. A D-band was observed in alkaline solutions of pyrocatechin and hydroquinone; it did not have an analogue in the benzene spectrum and it was the n – band of ortho- and paraquinones. In alkaline solutions there were also bands of singly charged (B^- and C^-) and doubly charged (B^{--} and C^{--}) anions displaced compared with the B^0 and C^0 bands of undissociated molecules in the direction of long wavelengths. Interpretation of the bands observed in alkaline solutions requires knowledge of pH of the solution and the variation with time of these bands. Bands which vary in the same way with time are due to the same anion. There are 6 figures and 11 references, of which 1 is Soviet, 4 English, 3 German and 3 mixed (Soviet, French and German).

SUBMITTED: October 6, 1959

Card 2/2

SMIRNOV, L.V.; SUPRUNENKO, A.I.

Electronic spectra of simple benzene derivatives as a function of pH. Part 2. Absorption spectra of nitrobenzene and nitrophenol. Opt.i spektr. 11 no.4:457-464 O '61. (MIRA 14:10)

(Nitrobenzene--Spectra) (Phenol--Spectra)

POP[illegible], K.R.; SMIRNOV, L.V.—

Polarization of electron transitions in the anthraquinone molecule.
Opt.i spektr. 13 no.2:280-282 Ag '62. (MIRA 15:11)
(Anthraquinone—Spectra) (Quantum theory)

KLIMENKO, I.B.; SMIRNOV, L.V.

Spectra of nitron and of a copolymer of acrylonitrile with vinyl acetate in the polarized infrared. Vysokom. soed. 5 no.10:1520-1526 O '63. (MIRA 17:1)

1. Leningradskiy tekstil'nyy institut imeni S.M. Kirova.

POPOV, K.R.; SMIRNOV, L.V.

Spectroscopic study of polyvinylene. Opt. i spektr. 14 no.6: 787-792 Je '63. (MIRA 16:8)

(Polymers--Absorption spectra)

ACC NR: AP7005768 SOURCE CODE: UR/0126/67/023/001/0192/0192

AUTHOR: Romanov, Ye. P.; Smirnov, L. V.

ORG: Institute of Metal Physics, AN SSSR

TITLE: Effect of matrix state on the properties of an alloy with a superconducting disperse phase

SOURCE: Fizika metallov i metallovedeniye, v. 23, no. 1, 1967, 192

TOPIC TAGS: superconductivity, superconducting alloy, zirconium base alloy, niobium, metal heat treatment

ABSTRACT: Heat treatment of the alloy Zr +4 wt.% Nb can result in segregation of disperse superconducting particles of a Nb-rich phase. with a critical transition temperature T_{cr} that is higher than the T_{cr} of the matrix. Measurements at 4.2°K established that the system of disperse superconducting particles distributed through the normal matrix can pass a sufficiently high superconducting current. However, tests in a magnetic field showed that, despite the dispersity of the segregated phase, the critical current density decreases with increase in intensity of the magnetic field, the critical values of the field being 10-12 kilo-oe. This is due to the effect of the normal-metal environment on the superconductivity of the disperse

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ACC NR: AT7005768

particles (the proximity effect). The state of the alloy with disperse particles in a normal matrix does not quite correspond to the spongy model, which assumes that the basis of the alloy is represented by a superconductor with lower parameters than those of the disperse particles. In this connection it was of interest to investigate the same alloy Zr + 4 wt.% Nb under conditions when the matrix also converts to the superconducting state; to this end, it was sufficient to reduce the temperature of measurements to 2°K, considering that the T_{cr} of the normal quenched alloy is 2.5-2.7°K, and to measure critical current density at 2°K as a function of the intensity of a transverse magnetic field. Segregation of disperse particles of the superconducting phase causes a rise in T_{cr} to 8°K. Findings: while in the quenched specimen (quenching from 950°C with subsequent 82% deformation) superconductivity is destroyed at 4 kilo-oe, in the specimen with disperse particles (quenching from 950°C with subsequent 82% deformation and tempering at 550°C) the superconducting state could not be destroyed even in a field of 24 kilo-oe. The critical parameters of superconductivity thus markedly increase as a result of segregation of a disperse superconducting phase with a higher T_{cr}. This also points to the importance of the state of the matrix. The properties corresponding to those predicted by the spongy model occur only on segregation of superconducting particles in a superconducting matrix, whereas their segregation in normal metal does not make it possible to obtain a superconducting material with a very high critical field. Orig. art. has: 1 figure

SUB CODE: 20, 13/ SUBM DATE: 02Dec66/ ORIG REF: 003/ OTH REF: 001

Card 2/2

L 39999-65 EWT(d)/EWT(m)/EWP(w)/EWA(d)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(z)/EWP(b)/EWP(l)/EWA(c) Pf-4/Pad IJP(c) JD/HW/GS

ACCESSION NR: AT4049810 S/0000/64/000/000/0027/0032

AUTHOR: Gorbach, V. G.; Maly shev, K. A.; Vladimirov, L. R.; Smirnov, L. V.

TITLE: Hardening of cast austenitic steel by the phase working method

SOURCE: Soveshchaniye po uprochneniyu detaley mashin, 1962. Protsessy uprochneniya detaley mashin (Processes of the hardening of machine parts); doklady soveshchaniya. Moscow, Izd-vo Nauka, 1964, 27-32

TOPIC TAGS: cast steel, austenitic steel, cast austenitic steel, phase working, steel hardening, steel grain structure, steel mechanical property

ABSTRACT: The term phase working means to alter the mechanical properties of a metal or alloy by direct or reverse phase transformation. This phenomenon appears to the greatest extent when the volume changes during crystal lattice transformation. The aim of the present investigation was to determine the possibility of hardening cast austenitic alloys by phase working and to determine the hardening characteristics peculiar to cast steel. Two alloys were tested: 1) C-0.39%, S -1.54%, Mn-0.61%, Cr-2.04%, Ni-17.75%, and 2) C-0.05%, Si-0.5%, Mn-0.4%, Cr-0.1%, Ni-27.0% and Ti-1.5%. This chemical composition permitted determination of the effect of the cast structure on alloy hardening by phase working. The direct and

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ACCESSION NR: AT4049810

reverse martensitic transformation temperature interval was determined with a D. S. Shteynberg and V. I. Zyuzin magnetometer. Both alloys were cast into 12-kg ingots and were then forged into 12x12 mm bars which were quenched from 1100C in water. The samples were 6 mm in diameter with a working part of 60 mm. The alloy containing Ti could not be tested since it is always magnetic. The samples were cooled to -196C and were then placed in a furnace heated to 720-740C (20-40C above the $\alpha \rightarrow \gamma$ transformation temperature) for 15-20 minutes, after which they were water quenched. The tests showed that multiple phase working does not improve the mechanical properties in comparison with single phase working. Phase working of cast steel leads to results similar to those obtained with forged alloys. The mechanical properties of a forged alloy are higher than for a cast alloy, while a cast alloy shows a continuous drop in resiliency as the number of phase working cycles increases. Further tests of the alloys showed that higher strength is obtained after phase working when the initial yield point is higher. The authors conclude that a coarse grain structure in cast alloys and dendritic liquation strongly affect the development of direct and reverse martensitic transformation, but do not prevent hardening of cast steel by phase working. As a result of phase

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ACCESSION NR: AT4049810

working, the strength of cast steel increases 1.5-2 times more than that of forged steel, although the absolute value remains lower by 10-20%. Cast steel after phase working has a coarse grain structure and dendritic heterogeneity. Orig. art. has: 3 figures.

ASSOCIATION: None

SUBMITTED: 21May64 ENCL: 00 SUB CODE: MM

NO REF SOV: 002 OTHER: 000

Card 3/3

KOMKOV, I.P.; IVIN, S.Z.; KARAVANOV, K.V.; SMIRNOV, L.Ye.

Synthesis of alkyl(aryl)tetrafluorophosphines and dialkyltrifluorophosphines and their interaction with inorganic sulfides. Zhur. ob. khim. 32 no.1:301-307 Ja '62. (MIRA 15:2)
(Phosphine) (Sulfides)

SMIRNOV, L.Ye.; NATAL'INA, V.N.; KUZNETSOV, R.I.

Rapid method for the determination of potassium in soil.
Zhur. anal. khim. 18 no.9:1051-1053 S '63. (MIRA 16:11)

CHERNOV, L. YE.

CHERNOV, L. YE. -- "Producting Charts of the Mountain-Taiga Regions on a Scale of 1:10,000 Using Aerial Photography (Drawing the Relief and Decipherment)." Leningrad Order of Lenin State U imeni A. A. Zhdanov. Leningrad, 1955. (Dissertation for the Degree of Candidate in Geographical Sciences)

SO: Knizhnaya Letopis', No 1, 1956, pp 102-122, 124

SMIRNOV, L.Ye.

Indicating and interpreting burnt forest areas on 1:10,000 scale maps in topographical surveying of mountain taigas. Vest. LGU 12 no.18:128-133 '57. (MIRA 11:3)
(Topographical drawing--Conventional signs)

SMIRNOV, L.Ye.

Reading colored large-scale aerial photographs of mountainous taiga regions. Uch. zap. LGU no.226:109-123 '58. (MIRA 11:11)
(Photographic interpretation)

SMIRNOV, L.Ye.

Determining the height of trees by means of aerial photographs of mountainous regions. Uch. zap. LGU no.226:124-137 '58. (MIRA 11:11)

(Aerial photogrammetry) (Trees)

SMIRNOV, L.Ye.

Stereoscopic representation of mountainous taiga reliefs on a 1:10 000 scale taking into consideration the height of woods. Vest.LGU 14 no.6:120-131 '59. (MIRA 12:6)
(Taigas) (Stereoscopic photography)

SMIRNOV, L.Ye.

Using aerophotography in studying and forecasting mudflows.
Vest. LGU 14 no.24:153-158 '59. (MIRA 12:12)
(Landslides) (Photography, Aerial)

SMIRNOV, L.Ye.

Topographic interpretation of aerial photos of mountainous taigas.
Vest.LGU 15 no.12:127-137 '60. (MIRA 13:6)
(Taigas) (Photographic interpretation)

SMIRNOV, L.Ye.

Stereoscopic photography using portable cameras in geological and geographical field studies. Vest. LGU 15 no.24:131-138 '60.
(MIRA 13:12)
(Photography, Stereoscopic) (Prospecting)

SMIRNOVA, M.P.; SMIRNOV, L.Ye.

Using aerial photography in studying vast deltas; based on the example of the Ili River. Izv.Vses.geog.ob-va 93 no.5:418-422 S-O '61. (MIRA 14:10)
(Ili Valley--Aerial photography) (Deltas)

SMIRNOV, L.Ye.; FROLOV, Yu.S.

Orientating aerophotos by shades. Vest. LGU 17 no.12:120-125 '62. (MIRA 15:7)
(Photography, Aerial)

SMIRNOV, L.Ye.

Subject and possibilities of developing the interpretation of aerial photographs. Vest. LGU 18 no.12:107-117 '63. (MIRA 16:8)
(Aerial photography in geography)

L 48266-65 EWT(d)/EWT(1)/EWP(1) GW

AM5013084 BOOK EXPLOITATION UR/ 13 12 BH

Smirnov, Leonid YEvgen'yevich

Principles of organization and planning in topographic, geodetic, and cartographic work (Osnovy organizatsii i planirovaniya topografo-geodezicheskikh i kartograficheskikh rabot) /Leningrad/ Izd-vo Leningr. univ., 1964. 89 p. biblio. (At head of title: Leningradskiy ordena Lenina gosudarstvennyy universitet imeni A. A. Zhdanova. Geograficheskiy fakul'tet) 1,150 copies printed.

TOPIC TAGS: geodesy, geodetic survey, cartography, topography, production engineering, government economic planning, economic organization

PURPOSE AND COVERAGE: This book is used as a basic text for the course "Organization and planning of cartographic production" for students of cartography in the Leningrad State University geography department. A general survey of the organization of geodetic, topographic and cartographic work is given, and operation instructions, directions, manuals, reference books and experiments by the producers are referred to. The book is also helpful for field workers in topographic-geodetic and cartographic production.

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L 48266-65

AM5013084

SUB CODE: ES, GO SUBMITTED: 14Oct64

NO REF SOV: 139 OTHER: 000

TP
Card 2/2

SMIRNOV, L.Ya.

Generalization in the interpretation of aerial photographs. Vest. LGU 20 no.18 '65 Seriia geologii i geografii no.3:97-106 (MIRA 18:10)

L 23467-65 EWT(1)/T/EED(b)-3 Pae-2 IJP(c) GW

ACCESSION NR: AP4049869 S/0307/64/000/002/0129/0140

AUTHOR: Smirnov, L. Ye.; Chernyayeva, F. A.

TITLE: Measuring areas on aerial photographs

SOURCE: Leningrad. Universitet. Vestnik, Seriya geologii i geografii, no. 2, 1964, 129-140

TOPIC TAGS: aerial photography, photographic distortion, aerial photo scale, topography, planimetry, tilt angle

ABSTRACT: Discussing the major distortion-producing factors on aerial photographs, such as the tilt angle of the photo, the local relief, inadequate scale determination, the deformation of the photographic material, etc., the authors note that the errors in measuring the areas on aerial photos were insignificant when the tilt angle involved in the photography was not excessive. These errors were found to be considerable greater on photographs taken of mountainous terrain or involving large angles of inclination. In the case of flat terrain, the combined effect produced by several sources of error (overall error) was determined by the rules for finding the mean square error. All the experimental measurements revealed a

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L 23467-65

ACCESSION NR: AP4049869

definite pattern according to which the accuracy of measurement increases with increasing size of the contour area. A wide tilt angle of the aerial photo, on the other hand, produces the opposite behavior: the measurement accuracy decreases with increasing area of the photographed object. It was also noted that the areas of quadrangles can be measured with greater accuracy than those of triangles and elongated figures. Orig. art. has: 12 formulas and 10 tables.

ASSOCIATION: None

SUBMITTED: 01May 63 ENCL: 00 SUB CODE: ES

NO REF SOV: 010 OTHER: 000

Card 2/2

SMIRNOV, L.Ye.

Basic problems of the organization and methodology of teaching the interpretation of aerial photographs. Vest. LGU 20 no.6:142-146 '65. (MIRA 18:4)

AIGINA, N.P.; SMIRNOV, L.Ye.

9th All-Union Conference on Aerial Photography. Vest. LGU 20 no.18
'65 Seriia geologii i geografii no.3:147-149
(MIRA 18:10)

L 07074-67 EWT(1) LIP(c) JGS
ACC NR: AP6028154 (A, N) SOURCE CODE: UR/0307/66/000/002/0096/0102

AUTHOR: Smirnov, L. Ye.; Kislovskoy, V. S.

ORG: none

TITLE: Topographic interpretation of aerial color photographs printed on different types of paper

SOURCE: Leningrad. Universitet. Vestnik. Seriya geologii i geografii, no. 2, 1966, 96-102

TOPIC TAGS: topography, color photo interpretation, photographic material, paper, aerial photograph

ABSTRACT: The authors compare the interpretability of a large variety of 1:10,000 and 1:17,000 spectrozonal aerial photographs of diversified terrains, printed on SB-2 two-layer color spectrozonal paper, on F-1 and F-2 three-layer color paper, on Czech Fomacolor paper, and on U. S. Kodak and Unibrom paper, using additive and subtractive printing techniques. The terrains were in the Central Siberian taiga zone and in the forest zone of the North-West European Soviet Union and covered populated localities and isolated buildings; communication and pipe lines; railways and roads; brooks, canals, rivers, beaches and lakes;

Card 1/2

L 11185-67 EWT(l)/EWT(m)/FCC/EWP(t)/ETI/EWP(n) IJP(c) GW/JD/JG/RO

ACC NR: AP6031063 SOURCE CODE: UR/0007/66/000/009/1126/1128

46

AUTHOR: Smirnov, L. Ye.; Kononova, L. N.

ORG: None

TITLE: Uranium content in atmospheric aerosols

SOURCE: Geokhimiya, no. 9, 1966, 1126-1128

TOPIC TAGS: uranium, radioactive aerosol, troposphere, filter, photometer / FPA-15 filter, LYuF-57 photometer

ABSTRACT: The results of investigations of uranium content in the troposphere are presented. The investigations were conducted mainly in 1959 by collecting aerosols from airplanes and then filtering them by means of FPA-15 filter material. The samples were calcined at 400 to 450 C and dissolved in a mixture of hydrofluoric and nitric acids. A fluorometric method of uranium determination was applied by using a luminescent photometer of LYuF-57 type. The test beads on a platinum wire were made of a dry nonluminescent sodium floride. On the basis of various experiments and data taken from other sources, it was determined that the negative effect of various chemical elements on the uranium fluorescence is practically negligible in aerosols. The results of determining the monthly average concentrations of uranium in the troposphere during 1959 are graphically represented with a sharp increase in uranium content indicated at the beginning of

UDC: 550.42:546.791+551.51

Card 1/2

L 11185-67
ACC NR: AP6031063

the year. Such a sharp increase is explained by atomic-bomb tests in 1958. Toward the end of 1959, the concentration had fallen to a normal level. It was approximately the same when measured in September 1963. Orig. art. has: 3 tables, 1 graph.

SUB CODE: 04, 18/ SUBM DATE: 02Sep65/ ORIG REF: 004/ OTH REF: 002

Card 2/2

SMIRNOV, M. PA 27T25

USSR/Engineering Oct 1947
Engines, Gasoline
Valves - Design

"Hydraulic Valve Tappets for the ZIS-110 Motor," M. Smirnov, Engr, 2½ pp

"Avtomobil'" No 10

This article describes the construction and operation of these new hydraulic tappets, as well as their care, to assist service and repairmen in maintenance. Diagrams of the hydraulic system, with a cross-sectional view of one of the tappet assemblies, as well as a cycle diagram of one of these new tappets in operation.

LC 27T25

SMIRNOV, M. (Leningrad)

Construction and design of power cable lines with voltages up to 35 kv. Prom. energ. 15 no.11:57 N '60. (MIRA 14:9)
(Electric lines--Underground)

KARGAKOV, N.; SMIRNOV, M.

Automotive transportation of the Chita Economic Council. Avt. transp. 37 no.2:33-34 F '59. (MIRA 13:1)
(Chita Province--Transportation, Automotive)

SMIRNOV, M.

Efficient organization of the transportation of Raychikhinsk coal. Avt. transp. 37 no.8:16-17 Ag '59. (MIRA 12:12)
(Raychikhinsk region--Coal--Transportation)

MAIER, Ye.; SOSHIN, B.; SMIRNOV, M.

Information. Avt. transp. 42 no.10:55-57 O '64. (MIRA 17:11)

SMIRNOV, M., dr

The Lufthanza Lines are trying hard to make up for the time lost in the postwar period. Medun transp 8 no.5:367-369 My '62.

YUG/1-59-3-37/57

32(1)

AUTHOR: Smirnov, Mihajlo, Doctor and Senior Analyst (Beograd)

TITLE: Development of World Air Freight Traffic (Razvoj vazdušnog robnog saobraćaja u svetu). II.

PERIODICAL: Tehnika, 1959, Nr 3, pp 494-497 (YUG)

ABSTRACT: This article is a supplement to the article dealing with the possibilities of developing air freight traffic in Yugoslavia and its significance for the economic development of the country, published in "Tehnika", 1958, Nr 12. The author describes the quantitative increase in air freight traffic, in the World the evergrowing use made of this means of transport, various kinds of freight transported by air and various problems connected with the development of air freight traffic. In a table on the amount of freight transported by the main World airlines in 1956 and in a table on the percentage of freight and

Card 1/2

SMIRNOV, Mihajlo, dr. (Beograd)

Problems of transportation and European integration. Medun transp 7 no.11:982-986 N '61.

1. Clan Redakcionog odbora, "Medunarodni transport".

(Transportation)

SMIRNOV,M.,dr.

Navigation on the Rhine River, and European communication policy.
Medun transp 8 no.3:186-188 Mr '62

KARTSEV, V.N.; SMIRNOV, M.A.

Means of raising the physical and mechanical indices of vulcanizates from SKT polysiloxane rubber. Kauch. i rez. 17 no.3:3-5 Mr '58. (MIRA 11:6)

1.Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka imeni akademika S.V. Lebedeva.
(Rubber, Synthetic)

SMIRENKIN, G.N., red.; SMIRNOV, M.A., red.

[Progress in the physics of nuclear fission. Translated from the English and German] Uspekhi fiziki deleniia iader; sbornik statei. Moskva, Atomizdat, 1965. 305 p. (MIRA 19:1)

SMIRNOV, M. A.

USSR/Electricity - Circuit Breakers Jul 50
Transmission Lines

"Phase-Connection Drive Mechanism in 110-Kilovolt Type MKP-160 Breakers," M. A. Smirnov, Engr

"Elek Stants" No 7, pp 33-35

Discusses various types of phase-connection drive mechanisms and details type PS-30 now in general use in 220-kv transmission lines. Includes information and diagrams on experimental trial of PS-30 drive used in conjunction with type MKP-160 current breakers. Results indicated drive mechanism can still make connection when voltage drops to 73.6% of normal voltage.

162T25

SMIRNOV, M.A., inzhener.

Remaking model RBA drives. Elek.sta. 24 no.7:55-56 Jl '53. (MLRA 6:7)
(Electric machinery)

SMIRNOV, M.A., inzhener.

Strengthening the drive of MKP-274 circuit breakers. Elek.sta. 24 no.11:37-39 N '53. (MLRA 6:11)
(Electric circuit breakers)

MAMONOV, Ye.I.; SMIRNOV, M.A., red.; MAZEL', Ye.I., tekhn. red.

[Universal computers; instruction coding systems, control, problems of operating speed, efficiency, and reliability] Universal'nye vychislitel'nye mashiny; sistemy kodirovaniia komand, upravlenie, voprosy skorodeistviia, proizvoditel'nosti i nadezhnosti. Moskva, Gosatomizdat, 1961. 113 p. (MIRA 15:11)

(Electronic digital computers)

MEL'NIKOV, Nikolay Prokof'yevich; SMIRNOV, M.A., red.; POPOVA, S.M., tekhn. red.

[Constructional types and design methods for nuclear reactors] Konstruktivnye formy i metody rascheta konstruktsii iadernykh reaktorov. Moskva, Gosatomizdat, 1963. 518 p. (MIRA 16:9)
(Nuclear reactors)

L 11204-66 EWT(m)/EWA(d)/T/EWP(t)/EWP(z)/EWP(b)/EWA(c) MJW/JD

ACC NR: AP5026363 SOURCE CODE: UR/0370/65/000/005/0149/0155

44,55

AUTHOR: Smirnov, M. A. (Sverdlovsk); Sokolkov, Ye. N. (Sverdlovsk); Shteynberg, M. M. (Sverdlovsk) 44,55 44,55 44,55

63 64 B

ORG: none

TITLE: Effect of plastic deformation temperature on the kinetics of age hardening in heat resistant austenite steel 44,55 44,55,16

SOURCE: AN SSSR. Izvestiya. Metally, no. 5, 1965, 149-155

TOPIC TAGS: austenite steel, carbide phase, steel microstructure, hardness, metal aging, plastic deformation, metal hardening, heat resistant steel, metal heat treatment, solid mechanical property, phase composition

ABSTRACT: The effect of the temperature of plastic deformation on the kinetics of age hardening in heat resistant austenite EI481 and EI612K steels was investigated. EI48 steel was reinforced with $Cr_{23}C_6$ and VC carbides and EI612K steel was reinforced with γ'-phase and some TiC. Steel samples (13 x 13 x 70 mm) were heated to 1180°C, held at this temperature for 2 hours and then cooled to 110-400°C at a rate of 500°C/minute. Next, the steel samples were soaked for 3 minutes, first in a furnace at 1100-700°C and then in a salt bath at 600° and 400°C. Following this, one portion of samples was deformed prior to hardening (reduced by 25-28%), and another portion was hardened directly. Some samples were quenched in water (directly from 1180°C) and subjected to deformation at room temperature. The EI481 steel samples were hard-

UDC: 669.14.018.44-157.8

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ened at 650°, 700°, 750°, and 800°C; and EI612K steel samples were hardened at 700°, 750°, and 800°C. Plastic deformation on steel age hardening increases with deformation temperature as well as with the rise in age hardening temperature. In contrast to EI612K steel, high-temperature plastic deformation in EI481 carbide steel results in reduced strength due to age hardening at 700°-800°C. Cold and warm plastic deformations accelerate these coagulation processes in the hardening phase which are beneficial from the material hardness viewpoint. For EI612K steel, the domains located next to the grain boundaries are more dense after the high-temperature plastic deformation than either after direct quenching or after warm deformation.

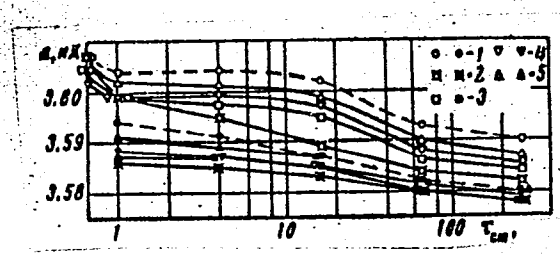

Fig. 1. Variation of lattice parameter "a" of the solid solution of EI481 steel as a function of time. (Light symbols indicate 650°C; solid symbols indicate 800°C). 1--directly quenched samples; 2--plastic deformation at 20°C; 3--plastic deformation at 600°C; 4--plastic deformation at 900°C; 5--plastic deformation at 1100°C.

L 11204-66

ACC NR: AP5026363

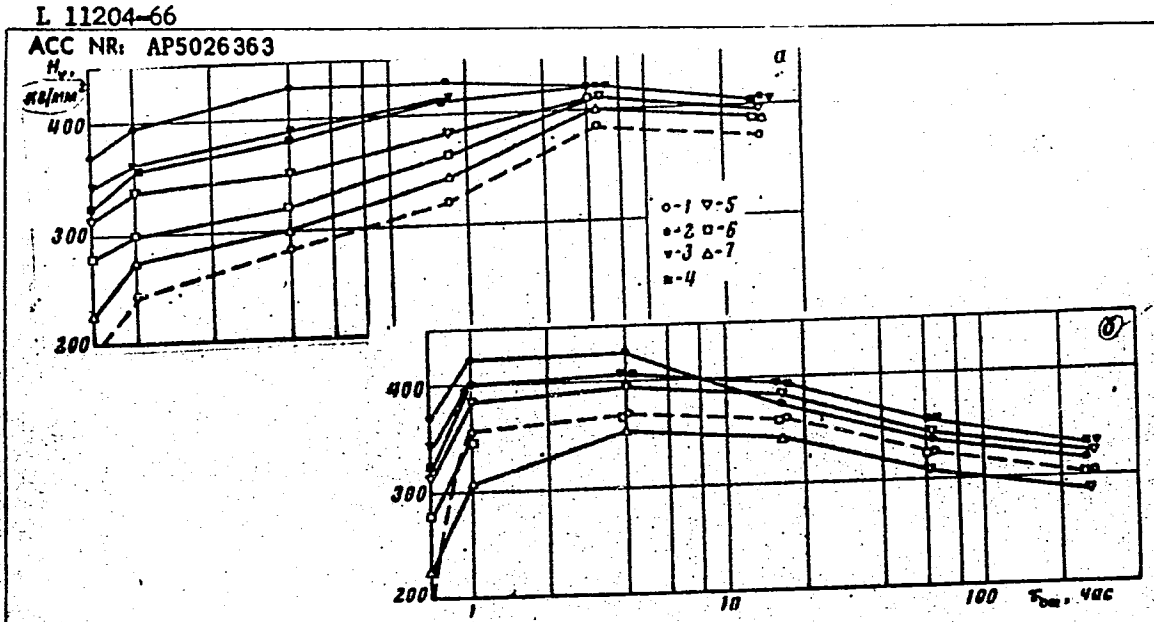

Fig. 2. Dependence of EI481 steel hardness upon aging duration at 650°C. a--650°C; b--750°C; where numbers correspond to various steel treatment conditions: 1--quenched steel; 2--deformation at 20°C; 3--deformation at 400°C; 4--deformation at 600°C; 5--deformation at 900°C; 6--deformation at 1000°C; 7--deformation at 1100°C.

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ACC NR: AP5026363

3

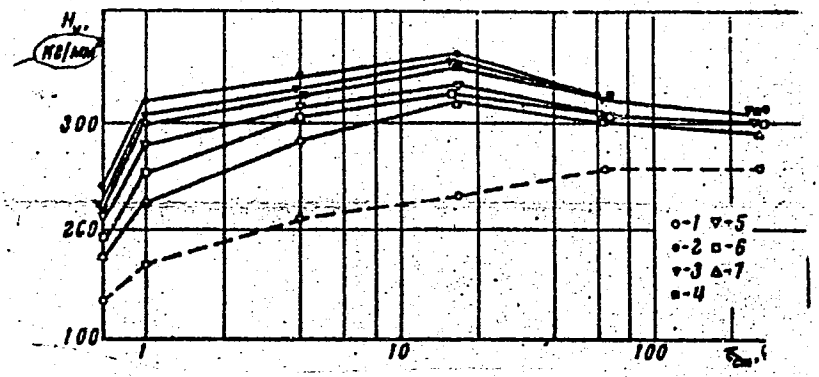

Fig. 3. Dependence of EI612K steel hardness upon aging duration at 700°C after various treatment: 1--quenched steel; 2--deformation at 20°C; 3--deformation at 400°C; 4--deformation at 600°C; 5--deformation at 900°C; 6--deformation at 1000°C; 7--deformation at 1100°C.

The steel microstructures were determined in cooperation with V. A. Yudin. Orig. art. has: 4 figures, 3 tables.

44,55

SUB CODE: 11/ SUBM DATE: 06May65/ ORIG REF: 003/ OTH REF: 001

Card 1/1

L 37013-65 EWT(m)/EWA(d)/T/EWP(k)/EWP(t)/EWP(b)/EWA(c) Pf-4 JD/HW

ACCESSION NR: AP5002269 S/0148/64/000/012/0112/0115 34 32 B

AUTHOR: Smirnov, M. A.; Shteynberg, M. M.; Sokolov, Ye. N.

TITLE: Effect of temperature and degree of plastic deformation on hardening of chromium-nickel-manganese austenitic steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 12, 1964, 112-115

TOPIC TAGS: austenitic steel, chromium nickel manganese steel, plastic deformation, solid solution, solid solution decomposition, age hardening, heat treatment

ABSTRACT: The effects of temperature and of plastic deformation on the aging and hardening of Cr-Ni-Mn (12.4, 7.5, 8.9%, respectively) austenitic steel were studied. Rapid cooling of the steel from the hardening temperature to 400-1100C caused a breakdown of the solid solution, as confirmed by a reduction of the lattice constants and increase in hardness. Plastic deformation in this temperature range caused more intense breakdown than the cooling; the decomposition was greater the greater the degree of plastic deformation. Maximum decomposition

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L 37013-65

ACCESSION NR: AP5002269

2

due to both cooling and plastic deformation occurred at 800-1100C. Prevention of preliminary decomposition was possible only at deformation temperatures below 1180C. The processes of solid solution decomposition affected the hardening of the steel on subsequent aging. The hardness of samples cooled to 600-1100C and aged, or subjected to plastic deformation at this temperature, decreased rapidly and attained optimum values only after deformation at 1180C. Some increase in hardness was observed in samples deformed at 20-400C. Thus cooling and plastic deformation must be considered in selecting conditions for the thermomechanical treatment and age hardening. Orig. art. has: 3 figures

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnical Institute); Institut fiziki metallov AN SSSR (Institute of the Physics of Metals, AN SSSR)

SUBMITTED: 17Mar64 ENCL: 00 SUB CODE: MM

NR REF SOV: 006 OTHER: 000

me

Card 2/2

SOKOLKOV, Ye.N.; SMIRNOV, M.A.; SHTEYNBERG, M.M.; NICHKOVA, M.M.

Effect of the temperature of plastic deformation on the kinetics of the aging of heat-resistant austenitic steel with carbide precipitation hardening. Fiz. met. i metalloved. 20 no.1:120-127 Jl '65. (MIRA 18:11)

1. Institut fiziki metallov AN SSSR i Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.

SMIRNOV, M.A.

AID Nr. 975-1 23 May

THERMOMECHANICAL TREATMENT OF HIGH-SPEED STEELS (USSR)

Shteynberg, M. M., L. B. Sabun, S. P. Shabashov, and M. A. Smirnov. Metallovedeniye i termicheskaya obrabotka metallov, no. 4, Apr 1963, 41-48. S/129/63/000/004/010/014

The effect of low- and high-temperature thermomechanical treatment (LTTT and HTTT, respectively) on the cutting properties and ductility of P9 (0.87% C, 9.0% W, 4% Cr, 2.10% V, 0.20% Mo), P9Ф5 (1.54% C, 10.15% W, 3.64% Cr, 4.86% V, 0.20% Mo), and P1ОК5Ф5 (1.46% C, 11.26% W, 4.44% Cr, 4.95% V, 0.19% Mo, 6.0% Co) high-speed steels has been studied at the Ural Polytechnic Institute and the Ural Heavy Machinery Plant. It was determined that LTTT (ausforming) enhances the tool life of P9 steel but has little effect on the tool life of the other two steels. The effect of LTTT on P9 steel was greatest at a temperature of 400°C with a 15% reduction. Under these conditions the wear resistance of the treated cutting tools was more than doubled. HTTT carried out at 900°C with a 15% reduction had less

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THERMOMECHANICAL TREATMENT [Cont'd] S/129/63/000/004/010/014

effect on the P9 steel and was even detrimental to the other two steels. Although both LTTT and HTTT improved the ductility of all three steels, the HTTT cannot be recommended for the P9Ф5 and P10K5Ф5 steels because it resulted in a considerable decrease in their cutting properties. The amount of residual austenite in hardened P9 steel decreases in LTTT when reduction is less than 5% and increases when reduction is above 5%. In the HTTT of hardened P9 steel the amount of residual austenite decreases as deformation is increased. Neither treatment has a noticeable effect on the austenite content in the other two steels.

[SS]

BOCHKAREV, V.V., red.; SMIRNOVA, A.M., red.; SMIRNOV, M.A., red.; POPOVA, S.M., tekhn. red.

[Measuring technique for radioactive preparations] Tekhnika izmerenii radioaktivnykh preparatov. Moskva, Gosatomizdat, 1962. 191 p. (MIRA 16:1)
(Radioactive substances--Measurement)

L 63499-65 EWP(k)/EWP(z)/EWA(c)/EWT(m)/EWP(b)/T/EWA(d)/EWP(w)/EWP(t) MJW/JD/HW

ACCESSION NR: AP5018862 UR/0126/65/020/001/0120/0127

539.389:669.15

AUTHOR: Sokolkov, Ye. N.; Smirnov, M. A.; Shteynberg, M. M.; Nichkova, M. M.

TITLE: Effect of the temperature of plastic deformation on the kinetics of aging of heat-resistant austenitic steel strengthened by carbide precipitation

SOURCE: Fizika metallov i metallovedeniye, v. 20, no. 1, 1965, 120-127

TOPIC TAGS: steel treatment, thermomechanical treatment, austenitic chromium steel, nickel containing steel, manganese containing steel, carbide precipitation strengthened steel /EI481 steel

ABSTRACT: The effect of the temperature of plastic deformation on the kinetics of aging of heat-resistant austenitic EI481 steel [0.36% C, 12.4% Cr, 7.5% Ni, 8.9% Mn, 1.23% Mo, 1.25% V, 0.25% Ni, and 0.5% Si] has been investigated. The steel was austenitized at 1180C, cooled rapidly to 1100—400C or to room temperature, rolled with reductions of up to 28%, and immediately water quenched. This was followed by aging for 1—256 hr at 650, 700, 750, and 800C. It was found that plastic deformation at all the investigated temperatures intensified decomposition of austenite and coagulation of the carbide phase and facilitated recrystallization during subsequent aging. The

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L 63499-65

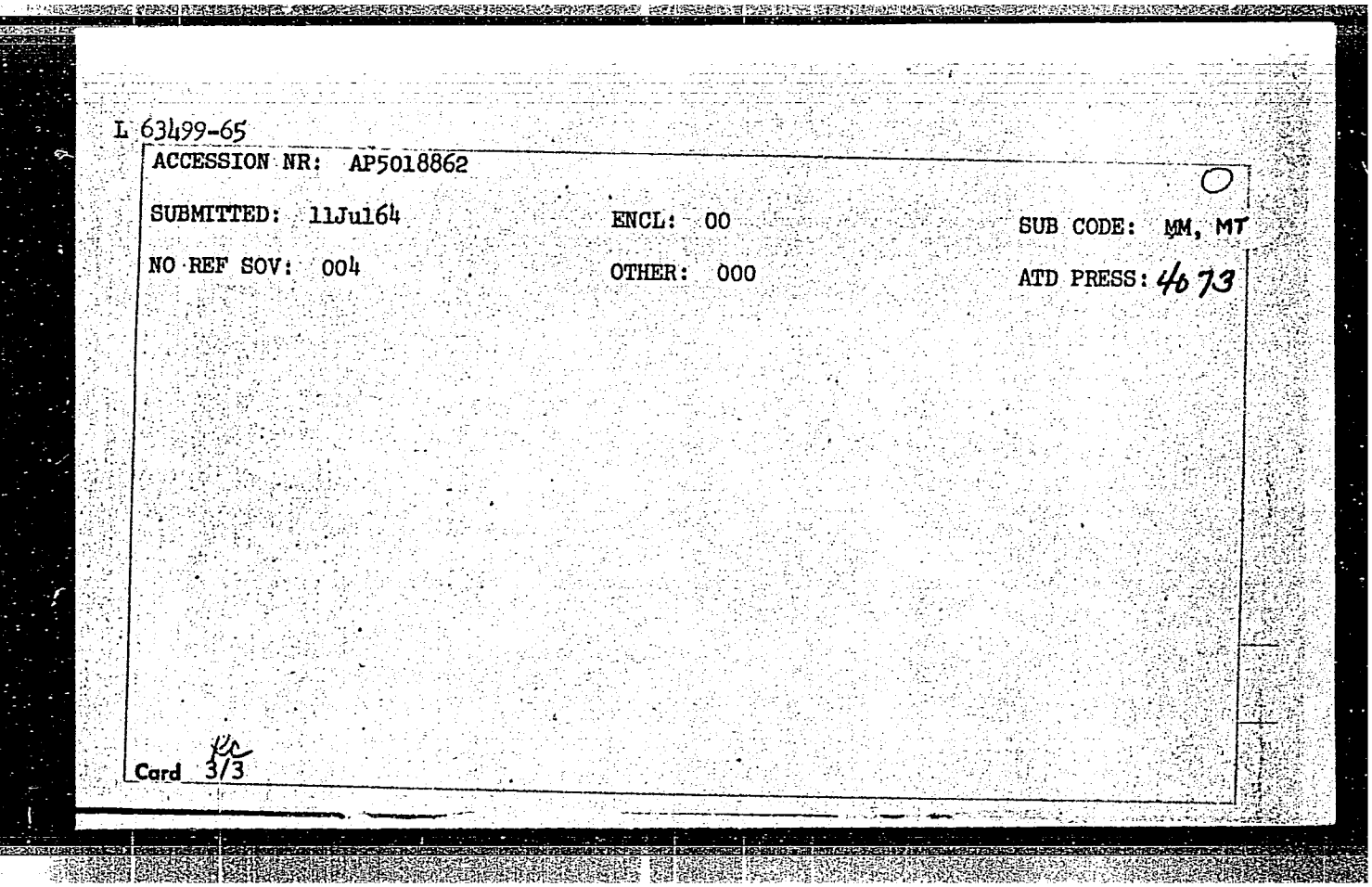
ACCESSION NR: AP5018862

lower the deformation temperature, the more intense the austenite decomposition, e.g., after aging for 1 hr at 650, austenite decomposition was 30% in the metal deformed at 20C compared with 11% in conventionally quenched metal. On cooling from the austenitizing temperature (1180C) to 1100—700C, a partial decomposition of the solid solution occurred. In specimens quenched from these temperatures without deformation, a noticeable decrease in the strengthening effect of aging at 700—800C was observed. Plastic deformation at 20C and at 1100—400C produced noticeable strengthening only by aging at 650C. With increasing aging temperature (700—800C) an appreciable increase in strengthening as compared with conventional heat treatment was obtained only after deformation in the 900—400C range. It is concluded that in steels such as EI481, which are strengthened by carbide precipitation, no significant strengthening by thermomechanical treatment can be obtained owing to an intensive coagulation of the precipitated carbide phase. On the contrary, in steel such as EI612K, in which an intermetallic compound is precipitated, a higher degree of strengthening can be obtained by changing the kinetics of aging since the coagulation of the strengthening phase proceeds at a substantially lower rate. Orig. art. has: 5 figures and 2 tables.

[MS]

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metals Physics AN SSSR); Ural'skiy politekhnicheskiy institut im. S. M. Kirova (Ural Politechnical Institute)

Card 2/3



L 63499-65

ACCESSION NR: AP5018862

SUBMITTED: 11Jul64 ENCL: 00 SUB CODE: MM, MT

NO REF SOV: 004 OTHER: 000 ATD PRESS: 4073

Card 3/3

SMIRNOV, M.A. (Sverdlovsk); SOKOLOV, Ya.N. (Sverdlovsk); SHNEYNBERG, M.M. (Sverdlovsk)

Effect of the temperature of plastic deformation on the kinetics of aging of heat resistant austenitic steels. Izv. AN SSSR. Met. no.5:149-155 S-O '65. (MIRA 18:10)

ACC NR: AP6021070 SOURCE CODE: UR/0148/66/000/006/0125/0130

AUTHOR: Shteynberg, M. M.; Smirnov, M. A.; Zhuravlev, L. G.; Sokolkov, Ye. N.

ORG: Ural Polytechnic Institute (Ural'skiy politekhnicheskiy institut); Institute of Metal Physics, AN SSSR (Institut fiziki metallov AN SSSR)

TITLE: Effect of the temperature of plastic deformation on the mechanical properties of high-temperature austenitic steels

SOURCE: IVUZ. Chernaya metallurgiya, no. 6, 1966, 125-130

TOPIC TAGS: high temperature steel, austenitic steel, plastic deformation, ultimate strength, plastic strength/EI481 high-temperature steel, EI612K high-temperature steel

ABSTRACT: This effect was investigated with respect to austenitic high-temperature steels EI481 (Cr-Ni-Mn) and EI612K (Ni-Cr) after they were subjected to 25-28% reduction by hot or cold rolling. To this end the specimens were subjected to tensile tests at room temperature and at 650°C. Findings: for steel EI481 in aged state (two-stage aging: 660°C for 16 hr and 760°C for 16 hr) under conditions of hot tests maximum strength is attained following deformation at 600°C, and maximum plasticity, at 1000-1100°C; in the latter case, altering the re-

Card 1/2 UDC: 669.14.018.45-12:620.17

gime of aging (reducing the aging temperature to 730°C) makes it possible to optimize both strength and plasticity. For steel EI612K (single-stage aging at 700°C for 25 hr), plastic deformation over the entire range of temperatures considered (up to 1100°C) enhances the steel's strength but its plasticity remains low; this can be remedied by introducing two-stage aging, but then strength is not as high. By contrast with EI481 steel, the optimal mechanical properties in hot tests of EI612K steel are assured not by high-temperature deformation but by warm and, particularly, cold deformation. The differences in the strain-hardening kinetics of these steels are chiefly due to the differences in their kinetics of aging and in the distribution and, particularly, coagulation rate of the particles of their hardening phases (carbide phase in the case of EI481 steel and intermetallic phase in the case of EI612K steel). Orig. art. has: 2 figures and 1 table.

SUB CODE: 11,13/ SUBM DATE: 02Jul65/ ORIG REF: 004

L 18738-66 EWT(m)/EWA(d)/EWP(t) JD/WB

ACC NR: AP6005136 SOURCE CODE: UR/0126/66/021/001/0048/0053

52
B

AUTHOR: Shklyar, R. S.; Smirnov, M. A.; Shteynberg, M. M.; Sokolkov, Ye. N.; Faiber, V. M.

ORG: Ural Polytechnic Institute im. S. M. Kirov (Ural'skiy politekhnicheskiy institut); Institute of Metal Physics, AS USSR (Institut fiziki metallov AN SSSR)

TITLE: Investigation of the fine structure of austenitic steel with intermetallide hardening, deformed over a broad range of temperatures 14

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 1, 1966, 48-53

TOPIC TAGS: fine structure, austenitic steel, x ray analysis, plastic deformation, metal grain structure/EI612K austenitic heat resistant steel

ABSTRACT: Knowledge of the type of fine structure arising in the hot- and cold-worked metal as a function of the regime of its deformation is a prerequisite to selecting the optimal regimes of its hardening. In this connection, the authors radiographically examined fine structure of austenitic heat-resistant steel EI612K (0.08% C, 14.9% Cr, 36.1% Ni, 3.25% W, 3.8% Co, 0.65% Ti, 1.26% Al) according to the shape, structure and intensity of the $(220)_\alpha$ and $(311)_\beta$ reflexes, with measurements of the lattice constant of the solid solution. Hardening phases were isolated by means of electrolytic dissolution. Texture was examined following various regimes of defor-

UDC: 669.15.018.45 + 157.97

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28310
S/081/61/000/016/017/040
B141/B101

54100

AUTHORS: Smirnov, M. B., Krasnov, Yu. N.

TITLE: Thermodynamics of formation of the complex fluoride anion TiF_6^{3-} with trivalent titanium in salt melts

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 16, 1961, 76, abstract 16B552 (Tr. In-ta elektrokhimii. Ural'skiy fil. AN SSSR, no. 1, 1960, 23 - 28)

TEXT: In addition to the known effect (RZhKhim, 1959, no. 9, 30663; 1960, no. 14, 56392) of F^- ions on anodic dissolution and cathodic titanium precipitation, the thermodynamics of formation of complex TiF_6^{3-} anions in melts was studied. E.m.f. measurements were made in cells with a Cl_2 electrode at 700 - 930°C to study the temperature dependence of the potential differences ΔE between the titanium oxide carbon electrodes in a pure, molten equimolar KCl - NaCl mixture with and without a 0.25% NaF addition: $\Delta E = (0.393 - 2.83) \cdot 10^{-4} T \pm 0.008$. From experimental data expressions were obtained for the equilibrium constant k of the

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SHVARTS, A.S., kand.tekhn.nauk; SMIRNOV, M.D., inzh.

From integrated to semiautomatic production lines in shoe manufacture. Kozh.-obuv.prom. 2 no.1:5-8 Ja '60. (MIRA 13:5)
(Shoe manufacture) (Assembly-line methods)

SMIRNOV, M.D., assistent

Stressed state of flat bending of wedge-shaped solids. Izv. vys.ucheb.zav.; mashinostr. no.5:98-105 '59.
(MIRA 13:4)

1. Kuybyshevskiy industrial'nyy institut.
(Elastic solids)

S/147/60/000/01/018/018
E031/E535

On the Solution of the Problem of the Bending of a Truncated Wedge Under a Distributed Load

these methods are discussed and it is shown that both give nearly the same results for the wedges considered except at the final section. The reason for this disagreement is discussed. The stressed state of the wedges was also investigated experimentally by the polarised optical method. The photoelastic data show that the approximate calculations usually give the stressed state correctly. As the length of the wedge and the region of the distributed load diminish, the stress concentration grows and the divergence of the theoretical solutions from the experimental ones increases at all sections. The analysis which was carried out shows that the approximate evaluation of the stressed state even for short wedge-shaped bodies can be made by the approximate methods discussed. In the case of the bending of short wedge-shaped bodies by a concentrated force reliable data for the stressed

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PHASE I BOOK EXPLOITATION SOV/4042

Leningrad. Universitet

Polyarizatsionno-opticheskiy metod issledovaniya napryazheniy; trudy konferentsii 13-21 fevralya 1958 goda (Optical Polarization Method for Stress Analysis; Transactions of the Conference of February 13-21, 1958). [Leningrad] Izd-vo Leningradskogo univ., 1960. 451 p. Errata slip inserted. 2,400 copies printed.

Resp. Ed.: S.P. Shikhobalov; Ed.: Ye.V. Shchemeleva; Tech. Ed.: S.D. Vodolagina; Editorial Board: S.G. Gutman, L.M. Kachanov, V.M. Krasnov, T.D. Makrutova, N.I. Prigorovskiy, V.M. Preshko, N.S. Rozanov, and Ye.I. Edel'shteyn.

PURPOSE: This collection of 58 articles is intended for scientists and engineers concerned with experimental stress analysis of machine parts and structural components.

COVERAGE: The collection contains reports presented at the conference on optical polarization methods in stress analysis held February 13 - 21, 1958, in Leningrad and attended by 324 delegates including representatives of the People's Republic of China, the Polish People's Republic, the German Democratic Republic, and the Republic of Czechoslovakia. The reports discuss general theoretical

problems and new methods of investigation and describe apparatus and materials used in the optical method. Solutions of specific two-dimensional and three-dimensional problems occurring in shipbuilding, aircraft design, engine construction, in various branches of heavy and precision machine design, in mining, metallurgy, hydraulic structures, railroad transport, in structural mechanics, geodynamics, in the control of stresses in products of the glass and electronic industry, etc., are given. Solution of the three-dimensional problem by means of the method of photoelasticity is introduced and the use of this method for the solution of problems associated with plasticity, creep, dynamics, hydrodynamics, etc., is demonstrated. Reports previously published elsewhere are printed here in abbreviated form. No personalities are mentioned. References are found at the end of 47 of the reports.

Optical Polarization Method (Cont.) SOV/4042

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SOV/147-59-2-19/20

AUTHOR: Smirnov, M.D.

TITLE: On the Problem of the Stress Conditions in a Step of a "Fir-Tree" Root of the Blade (K voprosu o napryazhennom sostoyanii zuba „yelochnogo„ zamka lopatki)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Aviatsionnaya tekhnika, 1959, Nr 2, pp 156-158 (USSR)

ABSTRACT: Due to the action of the centrifugal force acting on the blade root on the surfaces of contact between the disc and the blade steps, there will be a normal distributed load which, in the first approximation, may be taken as uniformly distributed (Fig 1). Thus the problem reduces to that of the two-dimensional bending of the stub of variable cross-section, the shape of the stub being a trapezium, under a uniformly distributed loading along the upper edge. There are several theories dealing with this problem; the "exact" theory of Ref 1 and the approximate theories of Ref 2 to 4 etc. In the case considered here the lower edge of the step is inclined to the upper edge at an angle of 45° and the ratio of the length of the

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On the Problem of the Stress Conditions in a Step of a "Fir-Tree" Root of the Blade

loaded portion of the upper edge to the height of the transverse section A-B of the stub at the root (Fig 2) is 0.647, following Ref 5, from which the theoretical stress distribution is adopted. The approximate formulae for the stresses are those of Ref 3 and 4, the normal stress σ_x being given by Eq (1), the power exponent k being found from the variational relation of Eq (2). The experimental values of stresses were obtained by the photo-elastic method. The results of computations and experiments are shown in Fig 2 (giving σ_x, curve 1 being based on Ref 3, while curve 2 is based on Ref 5, the crosses are the experimental data), Fig 3 (giving τ_{xy}) and Fig 4 (giving σ_y). Fig 5 shows a photo-elastic picture of lines of constant tangential stresses, for the case of a uniform normal loading of the stub. From the analysis of these results it may be concluded that the assumption of a uniform distribution of loading on the stub is sufficiently accurate to predict the stresses

On the Problem of the Stress Conditions in a Step of a "Fir-Tree" Root of the Blade

at sections not too close to the main body of the blade, although the same cannot be said if the distributed stress is replaced by a concentrated force at the end of the stub (Ref 6). There are 5 figures and 6 Soviet references.

ASSOCIATION: Kuybyshevskiy industrial'nyy institut, Kafedra soprotivleniya materialov (Industrial Institute of Kuybyshev, Chair of Strength of Materials)

SUBMITTED: October 6, 1958

SMIRNOV, M.D.

Concentration of stresses in numerous grooves. Izv. vys. uch. zav.; neft' i gaz 5 no.9:93-96 '62. (MIRA 17:5)

1. Kuybyshevskiy industrial'nyy institut im. V.V. Kuybysheva.

SMIRNOV, M.D.;

polystyrene. Plast. (MIRA 18:8)

REZNIKOV, A.N.; SMIRNOV, M.D.; YASHIN, G.G.

Investigating stresses in drills. Stan. i instr. 36 no.9:30-33 S '65. (MIRA 18:10)

SMIRNOV, M.D., kand. tekhn. nauk; YASHIN, G.G., inzh.; ALEKSEYEV, N.V., aspirant

Geometrical characteristics of the cross section of drills. Izv. vys. ucheb. zav.; mashinostr. no.7:142-146 '65. (MIRA 18:12)

1. Submitted May 29, 1964.

L 62176-65 EWT(m)/EPF(c)/EPR/EWP(j) Pc-4/Pr-4/Ps-4 WW/JAJ/RM

ACCESSION NR: AP5014692 UR/0191/65/000/006/0041/0044
678.746.22.01:539.219.2

AUTHOR: Smirnov, M.D.; Batrin, L. Ye.

TITLE: Residual stresses and the "silver" phenomenon in polystyrene

SOURCE: Plasticheskiye massy, no. 6, 1965, 41-44

TOPIC TAGS: polystyrene, polymer mechanical property, residual stress, residual deformation, silver phenomenon, polymer annealing

ABSTRACT: The "silver" phenomenon, associated with the formation and growth of visible cracks, is mainly observed following mechanical working in the surface layers of polystyrene parts as a result of the presence of large residual stresses. The article reports some results of a study of the development of "silver" cracks following mechanical working of brand "D" block polystyrene; in addition, ways of eliminating them by means of heat treatment are considered. The "silver" cracks appear in polystyrene at stresses considerably below the ultimate strength of the material. Although they do not cause a decrease in strength immediately, they precede a subsequent drop in ultimate strength by determining the stress-rupture strength. The initial block polystyrene has substantial residual strains which cause the appearance of "silver"

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cracks and cause changes in its size and shape during annealing of the finished product. The formation of "silver" cracks as a result of mechanical treatment may be prevented by annealing at a minimum temperature of 96C. The annealing should be performed immediately after the mechanical treatment of the part. "Doctor of Technical Sciences A.N. Reznikov was the scientific supervisor. In addition to the authors, A.I. Lipatov and S.N. Malakanov participated in the work." Orig. art. has: 7 figures.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: OC

NO REF SOV: 005 OTHER: 000

Card 2/2

SMIRNOV, M. E. (Ing.)

Doz. Y. A. Bolotovskiy, Ing. T. P. Kaya, and Ing. M. E. Smirnow, "The Choice of Profile Displacement Coefficients in Involute Gears."

paper presented at the 2nd All-Union Conf. on Fundamental Problems in the Theory of Machines and Mechanisms, Moscow, USSR, 24-28 March 1958.

SMIRNOV, M.F.,

127-58-6-4/25

AUTHOR: Smirnov, M.F., Chief Geologist of Noril'sk Mining-Metallurgical Combine

TITLE: Geologic and Mining Conditions of Exploiting the Noril'sk-I Deposit (Geologicheskiye i gornotekhnicheskiye usloviya ekspluatatsii mestorozhdeniya Noril'sk-I)

PERIODICAL: Gornyy Zhurnal, 1958, Nr 6, pp 15-19 (USSR)

ABSTRACT: The polymetallic deposit, Noril'sk-I, is situated in the northern part of the Noril'sk plateau. Its massive and disseminated sulfide ores form the main raw material base for the Combine imeni A.P. Zavenyagin. They are partly exploited by open-cut mining, partly by subsurface mining. The deposit is in a permanently frozen condition. The afflux of subterranean water in the pits below the belt of permafrost is insignificant and does not hamper exploitation in the northern part of the deposit. In the southern part conditions of exploitation are much more difficult, due to large quantities of subsurface or filtrating water and especially owing to the presence of large quantities of metane and other gases. Gas occurred for the first time in 1950 and since then has stopped all work on the level of plus 140 m. The layers of coal, carbonaceous shale

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Geologic and Mining Conditions of Exploiting the Noril'sk-I Deposit

and sandstones of the Tungusska series are the source of the gas formation. In the western part, the coal deposits are exploited by open mining. The sinking of pits here would also be hampered by gas. The quantity of these gases is estimated at 48.2 cu m for every 1,000 sq m of surface. Other parts of the Noril'sk-I deposit are not yet sufficiently explored. Taking into consideration their mineral composition, it is expected that they could be cleared of gas in a relatively short time. Their gas reserves are of less importance than that of the western part.
There is 1 graph.

ASSOCIATION: Noril'skiy gorno-metallurgicheskiy kombinat (The Noril'sk Mining-Metallurgical Combine)

AVAILABLE: Library of Congress

Card 2/2 1. Geology 2. Geophysical prospecting 3. Geophysical surveying

SMIRNOV, M.F.

Rz

GERM

USSR •

Research with sizes without the addition of fat. M. F. Smirnov. *Tekstil. Prom.* 11, No. 7, 40(1951); *Chem. Zentr.* 1951, II, 3248.—The substitution of rye or wheat flour for starch in sizes makes the addn. of fats unnecessary. M. G. Moore